

AT ISSUE

Medial meniscal root tears: Fix it or leave it alone

Question: In your opinion, when do you fix medial meniscal root tears? When do you leave them alone?

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Surgical intervention of medial meniscal root tears preserves joint function

Medial meniscal root tears are “radial” tears within 1 cm of the meniscal root insertion or an avulsion of the insertion of the meniscus. These injuries have been reported to change joint loading due to failure of the meniscus to convert axial loads into hoop stresses. This leads to decreased contact area and increased contact pressure and ultimately results in joint overloading and degenerative changes in the knee similar to a total meniscectomy state. This tear pattern was historically unrecognized, although more recently it has been suggested this “hidden” pathology may account for nearly 80% of the total knee replacements in patients younger than 60 years. Biomechanical studies have demonstrated that repair of medial meniscus posterior root tears leads to improved contact mechanics. Studies have also reported that patients who underwent a repair of the posterior root in the medial meniscus slowed the progression of arthritic changes compared with those who had a meniscectomy; although, this did not completely prevent the arthritic changes.

Posterior medial meniscal root tears are often times degenerative, but these can also occur with multi-ligament knee injuries in the acute setting. In addition, focal chondral lesions occur more commonly with medial than lateral-sided injuries. Non-anatomic placement of a PCL reconstruction tibial tunnel is a reported cause of iatrogenic medial meniscal posterior root tears. Identification of a meniscal root tear on MRI may be challenging due to the relatively small size of the root. However, coronal sections may reveal the presence of meniscal extrusion or vertical defects, and sagittal sections may reveal the “ghost sign” (absence of an identifiable meniscus or increased signal replacing the normal hypointense signal of meniscal tissue). These imaging pearls improve recognition of meniscal root tears (Figure 2).



Jorge Chahla



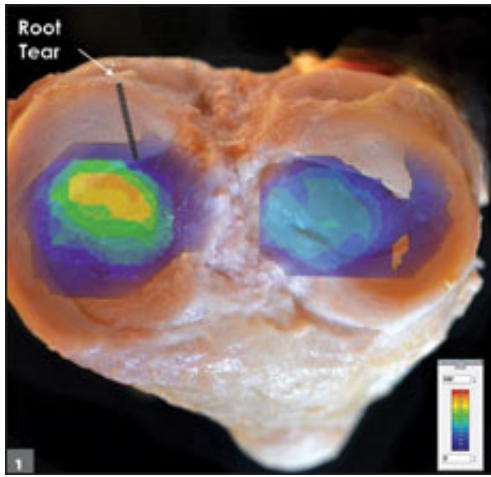
Andrew G. Geeslin



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Surgical indications

The goal of meniscal root repair is to restore the joint to a near native function of the meniscus and prevent cartilage degradation associated with nonsurgical treatment or meniscectomy. Indications for meniscal root repair are acute, traumatic root tears in patients with nearly normal or normal cartilage (Outerbridge grade



Representative pressure mapping demonstrates the contact area and pressure distribution in the lateral and medial compartments in a cadaveric left knee specimen at 30° of flexion.

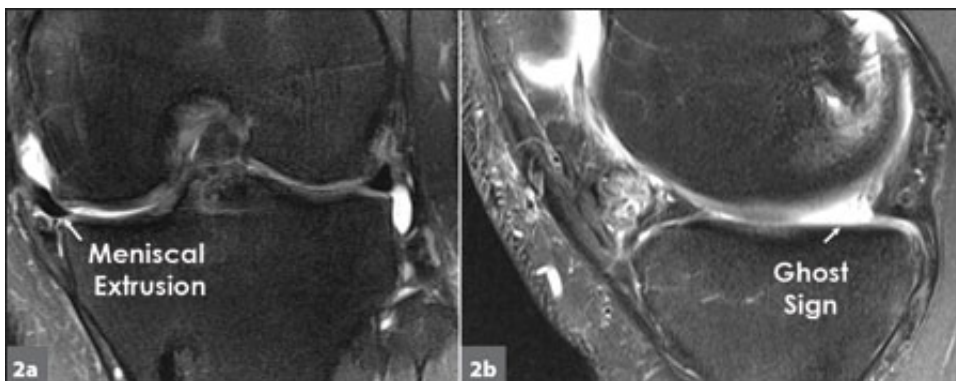
Images: LaPrade RF

0 to 2) and chronic symptomatic root tears in active patients without significant pre-existing osteoarthritis (OA).

Our preferred repair method utilizes a two-tunnel transtibial pull-out technique. This technique allows for anatomic reduction and fixation of the meniscal root by restoring the joint contact pressure and area similar to the intact state. Of note, drilling tibial tunnels may improve healing of the meniscus-bone interface due to the presence of progenitor cells and growth factors derived from the bone marrow. Chronic tears may be scarred to the capsule and require release of the meniscocapsular junction to allow anatomic repair.

Following root repair, patients are required to remain non-weight-bearing for 6 weeks. Physical therapy should start immediately after surgery and include early passive range of motion from 0° to 90° for the initial 2 weeks and progress to full range of motion

thereafter. Progressive weight-bearing begins at 6 weeks, with full weight-bearing at 8 weeks. Deep leg presses and squats greater than 70° of knee flexion should be avoided for at least 4 months after surgery.



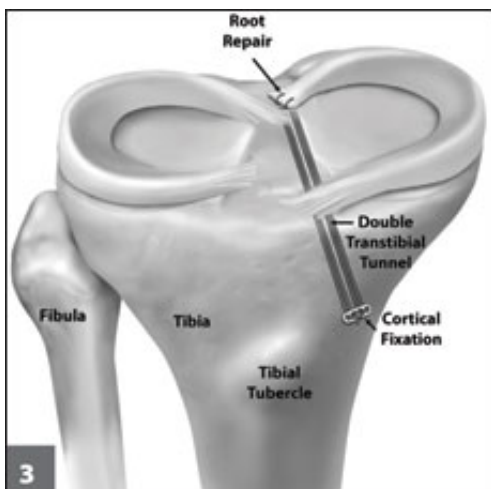
MRI of a left knee demonstrates meniscal extrusion (greater than 3 mm) and an edema of the medial femoral condyle on a coronal cut (a). In addition, a sagittal view shows the absence of the posterior horn of the meniscus (“ghost sign”) (b).

Nonsurgical treatment

Nonsurgical treatment is an option for elderly patients, those with significant comorbidities and those with

advanced OA (Outerbridge grade 3 or 4 chondromalacia of the ipsilateral compartment).

Symptomatic treatment with rest, ice, NSAIDs and/or an unloader brace may help alleviate symptoms in some cases. If mechanical symptoms are present in this subset of patients, a partial or subtotal meniscectomy may improve symptoms; although, these tears are not usually associated with traditional meniscal-based mechanical symptoms.



This schematic shows a posterior root repair of the medial meniscus of a right knee.

Summary

Medial meniscal posterior root tears represent an often unrecognized pathology with potentially devastating long-term effects. Although surgical repair has led to improved patient-reported function, there are conflicting reports on the progression of cartilage degeneration.

A high level of suspicion is required to detect these injuries, and repair is recommended to preserve joint function.

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